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INTERIM MEASURES WORK PLAN FOR SURFACE SOIL EXCAVATION AT SOLID WASTE  
MANAGEMENT UNIT 32 (SWMU 32) FORMER FUEL OIL TANK FARM NSA CRANE IN  
04/01/2012  
TETRA TECH

**Interim Measures Work Plan  
for  
Surface Soil Excavation  
at  
SWMU 32 – Former Fuel Oil Tank  
Farm**

**Naval Support Activity Crane  
Crane, Indiana**



**Naval Facilities Engineering Command  
Midwest**

**Contract Number N624670-08-D-1001  
Contract Task Order F273**

**April 2012**

**INTERIM MEASURES WORK PLAN  
FOR SURFACE SOIL EXCAVATION  
AT  
SWMU 32 – FORMER FUEL OIL TANK FARM**

**NAVAL SUPPORT ACTIVITY CRANE  
CRANE, INDIANA**

**COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted to:  
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**CONTRACT NUMBER N624670-08-D-1001  
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**April 2012**

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## ACRONYMS

ASTs	Aboveground storage tanks
ASTM	American Society for Testing and Materials
bgs	below ground surface
CLEAN	Comprehensive Long-term Environmental Action Navy
CTO	Contract Task Order
DRMO	Defense Reutilization Marketing Office
DRO	Diesel Range Organics
EMAC	Environmental Multiple Award Contract
FTMR	Field Task Modification Request
GRO	Gasoline Range Organics
HERO	Hazards of Electromagnetic Radiation to Ordnance
IDEM	Indiana Department of Environmental Management
IM	Interim Measures
IMWP	Interim Measures Work Plan
LUCs	land use controls
mg/kg	milligram per kilogram
Navy	United States Department of the Navy
NFA	No Further Action
NSA	Navy Support Activity
OICC	Officer in Charge of Construction
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyls
QCP	Quality Control Plan
RCRA	Resource Conservation and Recovery Act
RDCL	Residential Default Closure Level
RFI	RCRA Facility Investigation
SAIC	Science Applications International Corporation
SAP	Sampling and Analysis Plan
SSHSP	Site Specific Health and Safety Plan
SVOC	Semi-volatile Organic Compounds
SWMU	Solid Waste Management Unit
Tetra Tech	Tetra Tech, Inc.
µg/kg	microgram per kilogram
USEPA	United States Environmental Protection Agency

## EXECUTIVE SUMMARY

This Interim Measures Work Plan (IMWP) presents a plan to perform Interim Measure (IM) excavation and restoration of Solid Waste Management Unit (SWMU) 32 - Former Fuel Oil Tank Farm (site) at the Naval Support Activity (NSA) Crane in Crane, Indiana. This excavation will be performed to remove surface soil containing benzo(a)pyrene concentrations that exceed the Indiana Department of Environmental Management (IDEM) Residential Default Closure Level (RDCL) of 500 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). After completion of the IM excavation described herein, the Navy expects to obtain regulatory concurrence for no further action (NFA) for the site.

SWMU 32 contained multiple above-ground storage tanks (ASTs) used for storage of heating fuel oil between 1946 and 1996. In 1987, approximately 3,700 gallons of fuel oil was released onto the ground from an AST on the site. Multiple environmental investigation, remediation, and demolition projects were performed at SWMU 32 between 1989 and 1999. These projects addressed the 1987 spill and other potential impacts from fuel oil tank farm operations. The oil fuel tank farm was taken out of operation and all tanks were removed. The site was regraded and environmental work was completed in 1999. However, the environmental work did not produce sufficient data to obtain regulatory concurrence for closure of the site.

Tetra Tech prepared a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Sampling and Analysis Plan (SAP) that was approved by IDEM in 2010. The work described in the SAP was subsequently implemented and included surface soil, subsurface soil, sediment, and groundwater sampling. Based on the analytical data, Tetra Tech performed ecological and human health risk assessments and prepared a draft RFI report that proposed no further action (NFA) for the site. The draft RFI report identified an area on the site that had benzo(a)pyrene contamination above the RDCL. Based on a review of the draft RFI report, IDEM recommended removal of the surface soil with benzo(a)pyrene concentrations above the RDCL to achieve NFA, or to implement land use controls (LUCs) to mitigate potential site risks.

In response to those recommendations, the Navy is planning to excavate the surface soil at SWMU 32 that contains benzo(a)pyrene concentrations above the RDCL and dispose it off-site as described in this IMWP. IM will also include site restoration.

This IMWP describes the proposed excavation activities. After completion of the IM, a report will be prepared summarizing the work and the information will be incorporated into an updated version of the draft RFI report and propose NFA for the site.

## **1.0 INTRODUCTION**

This Interim Measures Work Plan (IMWP) presents the plan for Interim Measures (IM) to address benzo(a)pyrene surface soil contamination at Solid Waste Management Unit (SWMU) 32 - Former Fuel Oil Tank Farm (site). SWMU 32 is located at the Naval Support Activity (NSA) Crane in Crane, Indiana. The proposed IM will consist of excavation and off-site disposal of contaminated soil and restoration of the site. This IMWP was prepared for the United States Navy, Naval Facilities Engineering Command, Midwest (Navy) by Tetra Tech, Inc. (Tetra Tech) under Contract Task Order (CTO) F273 of the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N624670-08-D-1001.

### **1.1 PURPOSE AND SCOPE OF IMWP**

This IMWP presents background information about the site and describes the IM that will be performed to excavate and remove surface soil containing benzo(a)pyrene concentrations that exceed the Indiana Department of Environmental Management (IDEM) Residential Default Closure Level (RDCL) of 500 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). This IMWP presents the data that was used to define the extent of the area to be excavated as part of this IM, and the activities that will be implemented to perform the work.

The location of SWMU 32 on NSA Crane is shown on Figure 1-1. SWMU 32 - Former Fuel Oil Tank Farm primarily contained multiple aboveground fuel oil storage tanks and was operational from 1947 to 1996 as a bulk fuel oil storage facility. Operations were discontinued in a phased manner and initial environmental investigation and remediation was completed in 1999 without regulatory approval.

The purpose of this IMWP is to present an IM removal action to obtain regulatory concurrence for no further action (NFA) and closure of the site.

### **1.2 SWMU 32 DESCRIPTION**

SWMU 32 is located just northeast of Highway H-5, as shown on Figure 1-2. As shown on Figure 1-3, the site covers approximately 3 acres; it is currently vacant, grass-covered, and open. The site is generally flat with a slight slope to the south and southwest. The site is bounded by a chain-link fence and accessible through three gates; one on the east fence, one on the southeast side, and one on the southwest side. The Former Fuel Oil Tank Farm operated from 1947 to 1996 as an on-site bulk storage facility for fuel oil to heat buildings located at NSA Crane. Previous structures included the aboveground storage tanks (ASTs), associated piping, and tank farm containment walls. These structures were

removed between 1977 and 1999 due to decreased use of fuel oil at NSA Crane. The site has been vacant since 1999.

As shown on Figure 1-3, the only remaining structures are utility and light poles, and manholes within and near the chain-link fenced area of the site.

### **1.3 ENVIRONMENTAL HISTORY AND REGULATORY SUMMARY**

The site was primarily used for storage of heating fuel oil in large ASTs from 1946 to 1996. In 1987, approximately 3,700 gallons of fuel oil was released from an AST and contaminant cell. An unknown quantity of the oil discharged to the ditch south of the site and flowed into Culpepper Branch and then into First Creek. Some fuel oil presumably soaked into the ground of the site.

Multiple environmental investigations, removal and demolition projects, and soil excavation projects were performed at SWMU 32 between 1989 and 1999 to investigate the 1987 fuel oil spill and potential impacts from routine fuel oil tank farm operations. In 1997, approximately 3,000 cubic yards of fuel-contaminated soil and sand were removed from the site and disposed off site. Additionally, approximately 2,750 cubic yards of soil were removed, temporarily stockpiled, and returned to the southeastern portion of the site. Following these activities, the site was plowed to enhance biodegradation of the soil and the site was regraded.

Previous environmental work was completed in 1999; this environmental work did not address groundwater. A 1999 Navy memorandum concluded that, "The site is now clean.... No other cleanup activities are planned at this time" (Navy, 1999). A report issued in September 2000, concluded that SWMU 32 "...cannot be considered a clean site" and recommended that additional samples be collected to characterize the site (SAIC, 2000).

Tetra Tech prepared a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Sampling and Analysis Plan (Tetra Tech, 2010) that was approved by IDEM. Following SAP approval, sampling was performed at the site in April and September 2010. Based on analytical data from those sampling events, Tetra Tech prepared a draft RFI report including ecological and human health risk assessments (Tetra Tech, 2011). The draft RFI report proposed NFA for SWMU 32 but identified an area on the site that had benzo(a)pyrene contamination above the RDCL. IDEM reviewed the draft report and recommended a removal action for the benzo(a)pyrene contaminated surface soil to achieve NFA, or recommended implementation of land use controls (LUCs). In response to those recommendations, the Navy is planning to implement an IM removal action that will include excavation of surface soil containing benzo(a)pyrene concentrations that exceed the RDCL and off-site disposal.

#### **1.4 IMWP ORGANIZATION**

This IMWP presents general information about the site (Section 2), historical environmental investigation sampling and analysis results (Section 3), and a description of the proposed IM (Section 4). Appendices also present additional information and include:

- Appendix A - Photographs
- Appendix B – Supplemental Specifications

## **2.0 GENERAL SITE CONDITIONS**

The site is located on the northwest corner of NSA Crane as shown on Figure 1-1. Photographs of the site are presented in Appendix A. General characteristics about the site are described in this section.

### **2.1 PHYSIOGRAPHY AND TOPOGRAPHY**

The site is located on a promontory of land that runs northwest to southeast along a primary road, Highway 5, as shown on Figure 1-2. This area was flattened and regraded in the 1940s to develop the site for aboveground storage tanks. The storage tanks and associated components have been removed and the site is currently an open grass covered area that is generally surrounded by wooded, gently sloping terrain on the eastern, southern and northern sides (Figure 1-2). An unnamed drainage ditch and tributary of Culpepper Branch runs south through the center of the site and to the south of SWMU 32. Elevations on the SWMU 32 site range from approximately 550 to 575 feet above mean sea level (amsl) (Figure 1-3). The maximum elevations at SWMU 32 (about 575 feet amsl) occur in the most northeastern corner of the site.

### **2.2 SURFACE WATER HYDROLOGY**

As shown on Figure 1-3. The topography at SWMU 32 is relatively flat and generally slopes to the south and southeast. Surface water runoff from the site flows to a shallow ditch that flows south through the site and then flows south and then southwest into a pipe that flows underneath Highway 5 and into the Culpepper Branch Creek.

### **2.3 GEOLOGY**

SWMU 32 is underlain by the Lower Pennsylvanian age Mansfield Formation of the Raccoon Creek Group and the underlying Upper Mississippian age Stephensport and West Baden Groups. The alluvial sediments consist of unconsolidated clay, silt, and sand layers. Bedrock at the site, which consists of discontinuous layers of siltstones, sandstones, shales, and coal seams, are situated below the alluvium and were not encountered during environmental investigations. During the RFI for SWMU 32, six temporary monitoring wells were installed in the unconsolidated surface soil and ranged in depth from 20 to 24 feet. There was no evidence of contamination in the bedrock.

### **2.4 SOILS**

SWMU 32 is covered with residual soils and reworked soils that range from 2 to 6 feet thick. The soils are the result of organic material mixing with alluvial sediments.

## **2.5 HYDROGEOLOGY**

Six temporary wells were placed during the RFI to depths ranging from 20 to 24 feet below ground surface (bgs). A water-bearing zone was encountered in silt layers of the unconsolidated alluvial sediments. The silt layers do not occur at the same elevation for each well. Groundwater flow generally mimics the site topography and is assumed to flow to the east and southeast towards a branch of Culpepper Creek.

### **3.0 ENVIRONMENTAL REMEDIATION AND INVESTIGATION SUMMARY**

Environmental cleanup activities were performed in response to spills when the tank farm was in operation. As the facility was taken out of service, environmental investigations and remediation were performed and completed 1999. However, regulatory concurrence of the remediation work was never obtained and an RFI process began in 2009. This IMWP is part of the formal RFI process. The environmental investigation and remediation history of the site is summarized in this section.

#### **3.1 PREVIOUS ENVIRONMENTAL REMEDIATION AND INVESTIGATIONS**

Environmental cleanup work was performed during operation of the facility in response to the 1987 release and general operational spills and releases. A more detailed history of the site and previous environmental remediation activities are presented in the draft RFI report (Tetra Tech, 2011)

#### **3.2 RFI SAMPLING AND ANALYSIS**

An RFI was initiated in 2009 to further investigate the site. This process included development and regulatory approval of a SAP. RFI field work was conducted in April 2010 and September 2010 and included collection of surface soil, subsurface soil, groundwater, and sediment samples. The analytical data were used to perform a Human Health Risk Assessment and Ecological Risk Assessment and incorporated into a draft RFI report for the site.

In April and September 2010, a total of 65 borings were drilled and 62 surface and 72 subsurface soil samples were collected from the site. The locations of these soil samples are identified on Figure 3-1. All surface soil samples were collected from 0 to 2 feet bgs. The surface and subsurface soil samples were analyzed for select semi-volatile organic compounds (SVOCs) which included benzo(a)pyrene.

Two surface soil samples collected during the April 2010 sampling showed benzo(a)pyrene concentrations that exceeded the RDCL of 500 µg/kg. As shown on Figure 3-2, the surface soil sample collected from location 32SO-17 had a benzo(a)pyrene concentration of 2900 µg/kg, and the surface soil sample collected from location 32SO-18 contained benzo(a)pyrene at 521 µg/kg. Because the surface soil benzo(a)pyrene contamination was not bounded, five additional surface soil samples were collected in September 2010 and were analyzed for benzo(a)pyrene to better define the extent of the surface soil contamination. The September 2010 analytical data showed one surface soil sample collected from 32SO-64 with a benzo(a)pyrene concentration of 3450 µg/kg. The benzo(a)pyrene concentrations from the four other surface soil samples collected in September 2010 were less than the RDCL.

The analytical data from these two 2010 sampling events were used in a human health risk assessment and were presented in a draft RFI report that proposed NFA for the site.

### **3.3 REGULATORY APPROACH**

The draft RFI Report was sent to IDEM for review. Based on their review, IDEM recommended removal of the benzo(a)pyrene contaminated surface soil with concentrations above the RDCL to achieve NFA, or the application of LUCs to mitigate potential human health risks.

The Navy is planning to proceed with an IM excavation to obtain NFA for the site. The objective of the excavation is to remove soil containing benzo(a)pyrene concentrations that exceed the IDEM RDCL of 500 µg/kg.

### **3.4 SUPPLEMENTAL SAMPLING IN NOVEMBER 2011**

Before proceeding with IM excavation, supplemental sampling was performed to define the limits of excavation. This supplemental sampling was described in a Field Task Modification Request (FTMR) form that was prepared in September 2011. This FTMR form described the details of the supplemental sampling and referenced the approved January 2010 SAP. This FTMR form included figures and tables that defined the sampling necessary to determine the horizontal and vertical extent of soil containing benzo(a)pyrene at concentrations above the RDCL. This supplemental sampling was performed in November 2011.

The November 2011 FTMR sampling included collection of 107 surface and subsurface soil samples from 38 soil borings. In soil borings 32SO-66 and 32SO-67, subsurface samples were collected from 2 to 4 feet bgs and 4 to 6 feet bgs. Surface soil samples were not necessary in these two borings because the previous investigation showed elevated concentrations of benzo(a)pyrene at the surface. Three samples were collected from the other soil borings (with the exception of two borings that hit refusal at 2 feet bgs) at 2 foot intervals from surface to 6 feet bgs.

A phased approach for analysis of the 107 soil samples was implemented for cost efficiency purposes. All soil samples were extracted for analysis, but only 14 surface soil samples and 2 subsurface soil samples were initially analyzed. The 2 subsurface samples collected from 32SO-66 and 32SO-67 (collected from 2 to 4 feet bgs) and the surface soil samples collected from 32SO68 through 32SO81 were initially analyzed for benzo(a)pyrene. The remaining samples were extracted but held for analysis pending the initial results.

All 16 samples that were initially analyzed from the November 2011 sampling event had benzo(a)pyrene concentrations less than the 500 µg/kg RDCL. However, the field duplicate for the 32SO-70 surface soil sample exceeded 500 µg/kg. Therefore the subsurface soil sample collected between 2 and 4 feet bgs at location 32SO-70, and the 32SO-86 surface soil sample were analyzed. These two samples had concentrations less than the 500 µg/kg. All analytical results are shown on Table 3-1.

The analytical results are the basis for the horizontal and vertical limits of the area to be excavated and are shown on Figure 3-2. As shown on Figure 3-2, there were four soil samples (32SO-17, 32SO-18, 32SO-64, and 32SO-70), that had benzo(a)pyrene concentrations above the RDCL. All of these were surface soil samples were collected from 0 to 2 feet bgs. Subsurface (collected more than 2 feet bgs) soil samples in the area to be excavated and soil samples along the perimeter of the excavation collected from 0 to 2 feet bgs had benzo(a)pyrene concentrations below the RDCL.

The IM excavation will be to the limits defined by existing sampling results. As shown on Figure 3-2, the sample locations are located every 20 feet along the perimeter of the excavation. Therefore, no additional confirmation samples will be collected or analyzed after excavation.

## **4.0 SOIL REMOVAL INTERIM MEASURES**

The IM described in this IMWP will be performed through a Navy Environmental Multiple Award Contract (EMAC). The IM activities are described on Figures 4-1, 4-2, 4-3 and 4-4, and in the Supplemental Specifications presented in Appendix B. As shown in those documents, and as summarized in this section, the work will be performed through the following major components:

- Planning and Permitting
- Site Preparation and Support Activities
- Soil Excavation
- Transportation and Off-site Disposal of Soil
- Backfill and Restoration
- Summary Report

The EMAC contractor will be required to perform all IMWP implementation activities in accordance with the EMAC Basic Contract and Supplemental Specifications presented in Appendix B. The EMAC contractor will be required to submit planning documents (including a detailed Work Plan) and obtain Navy approval before performing the work.

The EMAC contractor will coordinate all field work through the Navy Officer in Charge of Construction (OICC). The Navy will provide a full-time oversight representative during IMWP implementation. The EMAC contractor shall provide a minimum of 7 days notification to the OICC and the Navy's oversight representative prior to mobilization.

### **4.1 PLANNING AND PERMITTING**

The EMAC contractor will prepare planning documents and obtain necessary site permits prior to performing the work. The planning documents will include:

- Work Plan
- Site Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis
- Project Quality Control Plan (QCP)

The EMAC contractor shall obtain all required permits, including but not limited to the following:

- Safety & Building Availability Permit
- Digging Permit
- Hazards of Electromagnetic Radiation to Ordnance (HERO) (approval for portable radios)

## 4.2 SITE PREPARATION AND SUPPORT ACTIVITIES

Prior to, during, and after, surface soil removal, site preparation and other support activities will be performed including:

- Erosion and Sediment Control
- Site Support Measures
- Traffic Control

**Erosion and Sediment Control.** Before excavation activities begin, erosion and sediment controls will be established to prevent impacts to surface water downgradient of the disturbed areas. For example, this will include silt fence downgradient of the disturbed area, temporary surface stabilization, and other measures. Erosion and sediment control measures will remain in place until soil excavation, backfilling, and restoration activities are completed. Completed restoration activities include establishment of permanent vegetation. The disturbed area to be vegetated will be regularly inspected and maintained until the area is stabilized. Once the area has been restored and stabilized, the EMAC contractor will remove temporary erosion and sediment control structures such as the silt fences. Erosion and sediment control measures will be in accordance with the Indiana Handbook (IDEM, 1992).

**Site Support Measures.** Site support measures will include installation of access controls such as fencing, a decontamination pad, and other measures to support the work. A temporary decontamination pad will be set up to clean equipment used to remove, excavate and transport contaminated material. The pad will be sized to accommodate all the equipment to be used at the site and will be constructed in a manner that contains all the contaminated materials removed from equipment and the liquids used to clean the equipment. Contaminated materials removed from the equipment will be disposed with the removed soil. Wash water will be managed as described in the approved water management plan. The EMAC contractor must keep his equipment clean to minimize the spread of contaminated material and soil to adjacent areas and roads.

**Traffic Control.** The EMAC contractor shall submit a Traffic Control Plan as part of the Work Plan. The Traffic Control Plan shall present details about travel routes within NSA Crane and describe compliance with security inspection requirements and to minimize interruptions to facility operations. The EMAC contractor vehicles must travel on the roads and use the weighing facilities shown on Figure 4-4. The Traffic Control Plan must function in accordance with the Access and Security requirements and the Traffic and Entry Plan. As shown on Figure 4-4, access to NSA Crane shall be through the Crane Gate (Gate house No. 4) in the northwest. The EMAC contractor is not permitted to travel within restricted

areas of the facility. All waste hauling vehicles will be weighed upon arrival and at time of departure using the certified weight scale located at the Defense Reutilization and Marketing Office (DRMO) (Building 1940). The DRMO scale is operated between the hours of 7 AM to 3 PM, and weight tickets are available.

#### **4.3 SOIL EXCAVATION**

This work will consist of removing the defined areas of surface soil with contamination that exceeds the RDCL for a benzo(a)pyrene. The area to be excavated is shown on Figure 4-2. As shown on that figure, the area to be excavated covers an area 100 feet long (east-west) and either 40 or 55 feet wide (north-south). The depth of the excavation will be two feet. A typical excavation cross-section is shown on Figure 4-3. The estimated quantity of contaminated soil to be removed is approximately 350 cubic yards.

Tetra Tech will mark the limits to the excavation area prior to removal of the soil. The EMAC contractor will be responsible to excavate within the defined limits. The actual method to remove the contaminated soil will be determined by the EMAC contractor. However, the work is expected to be performed with an excavator or backhoe. The excavated soil may be temporarily staged on-site pending final approval and/or scheduling with the disposal facility. Approval may require obtaining and analyzing a representative sample or samples of the material before and/or after excavation.

All work will be performed in accordance with the Work Plan, QCP and the HASP. This will include dust control and compliance with Occupational Safety and Health Administration (OSHA) requirements. The EMAC contractor will also be required to perform some site preparation work prior to excavation and other support activities.

#### **4.4 TRANSPORTATION AND OFF-SITE DISPOSAL OF SOIL**

The EMAC contractor will be responsible for transportation and offsite disposal of the contaminated soil that exceeds the RDCL. All onsite transportation shall be performed on the roads as shown on Figure 4-4.

The EMAC contractor will submit the name of the proposed disposal facility with the cost proposal. The proposal will include facility name, contact information, permit number, and documentation/certification of the facility to accept the SWMU 32 waste. After selection, the EMAC contractor will provide transportation, treatment and disposal details in the Work Plan.

Disposal requirements vary with each disposal facility. However, disposal facilities near Crane will accept soil contaminated with unused fuel oil based on generator knowledge. The EMAC contractor will be

responsible for the Navy to notify the selected disposal facility that the former Fuel Oil Tanks contained only fuel oil and the contaminated soil was the result of an unused fuel oil release.

The EMAC contractor shall be responsible for providing and carrying waste manifests, bills of lading, placards, labeling, markings, licensing, and any other transportation/disposal documentation as required by federal, state, and local regulations. The Navy will supply a United States Environmental Protection Agency (USEPA) Generator ID number for this documentation. The EMAC contractor shall prepare all transportation documentation, including bills of lading, manifests, etc. for approval and signature by the Navy. A representative of the Navy will sign completed shipping manifests and bills of lading.

The EMAC contractor shall provide the Navy a two week notice prior to mobilization to the Site and a minimum of 48 hour notice (2 business days) prior to shipping materials from the Site.

#### **4.5 BACKFILL AND RESTORATION**

The excavation will be backfilled after the contaminated soil is removed from the site. The area will be backfilled to match existing grade. The backfill soil obtained from an off-site borrow source will have properties similar to the native SWMU 32 soils. The backfill soil will be obtained from a source where due diligence shows no evidence of a release of a regulated substance (i.e., clean fill). A certification must be provided regarding the origin of the clean fill, including a statement that, to the best of the provider's knowledge, the backfill soil has not been contaminated with the release of regulated substances. The backfill soil will be subject to analytical testing to assure that it is not contaminated and meets the following requirements.

- TPH, diesel range organics (DRO), USEPA method SW-846 8015M DRO - less than 1 milligram per kilogram (mg/kg)
- TPH, gasoline range organics (GRO), USEPA method SW-846 8015M GRO - less than 1 mg/kg
- Sum of benzene, toluene, ethylbenzene, and xylenes, USEPA method SW-846 5030 / 8021 - less than 1 mg/kg
- Total polychlorinated biphenyls (PCBs), USEPA method SW-846 8082 – Less than 1 mg/kg
- 4,4'-DDD, USEPA method SW-846 8081 - Less than 3.2 µg/kg
- 4,4'-DDE, USEPA method SW-8468081 - Less than 3.2 µg/kg

- 4,4'-DDT, USEPA method SW-846 8081 – Less than 3.2 µg/kg
- Dieldrin, USEPA EPA method SW-846 8081 – Less than 3.2 µg/kg
- Heptachlor, USEPA method SW-846 8081) – Less than 1.5 µg/kg
- Alpha-chlordane, USEPA method SW-846 8081 – Less than 1.5 µg/kg
- Gamma-chlordane, USEPA method SW-846 8081 – Less than 1.5 µg/kg
- Lead, USEPA Method SW-846 6010B or 6020 – less than 400 mg/kg (US EPA Residential Screen Level and IDEM Direct Contact Screening Level)

Backfill material will include common fill and topsoil.

**Common Fill.** Common fill will be used to backfill the excavation to a depth of 6 inches below final grade. This material will be placed into the excavation in maximum 9-inch-thick lifts and compacted to 90 % of standard proctor density. Common fill will meet the following physical characteristics:

- American Society for Testing and Materials (ASTM) D 2487, Classifications GW, GP, GM, SW, SP, or SM
- ASTM D 4318, Liquid limit, 35 maximum
- ASTM D 4318, Plasticity index, 12 maximum
- Maximum of 25 percent by weight passing ASTM D 1140, No. 200 sieve
- Maximum particle size of 1 inch

**Topsoil.** The uppermost 6 inches of backfill used to establish final grades will be medium-textured loam suitable for establishing vegetation.

The estimated backfill material requirements are:

- Common fill      265 cy
- Topsoil            85 cy

Following backfilling, the disturbed area will be restored using permanent seeding. Restoration will consist of surface preparation, fertilizing, seeding, and mulching. Activities to establish permanent

seeding will be implemented as soon as possible following the construction of final grades. Permanent vegetation activities include site/seed bed preparation, seeding, and mulching of the restored excavation areas and the surface soils located underneath support facilities.

The procedures and requirements for permanent seeding activities are presented in Section 3.12 of the Indiana Handbook for Erosion Control in Developing Areas (Handbook) (IDEM, 1992). The seed mixture recommended for use at SWMU 32 will be a standard Indiana seed mixture for open and disturbed areas. The seed mixture includes perennial ryegrass and tall fescue. Planting rates and optimum soil pH for this mixture are presented in the Handbook. Following seeding, the seeded areas will be covered with mulch and tack (e.g., coconut fiber matting) to provide additional stabilization until vegetation is established.

#### **4.6 CONSTRUCTION COMPLETION REPORT**

The EMAC contractor will prepare and submit a Construction Completion Report and provide it to the Navy or their representative within 30 days of demobilization from the Site. The Construction Completion Report will include all construction documentation for the project.

## 5.0 REFERENCES

Indiana Department of Environmental Management (IDEM), 1992.. *Indiana Handbook for Erosion Control in Developing Areas*.

Navy, 1999. Department of the Navy, Crane Division, Naval Surface Warfare Center. 1999. Tank Farm Demolition and Cleanup.

SAIC (Science Applications International Corporation), 2000. *Environmental Monitoring Report for the Tank Farm at Crane Division Naval Surface Warfare Center*. September.

Tetra Tech, 2010. *Final SWMU 32 Sampling and Analysis Plan*. January.

Tetra Tech, 2011. *Draft RFI Report, SWMU 32 – Former Tank Farm Area*. May.

## TABLES

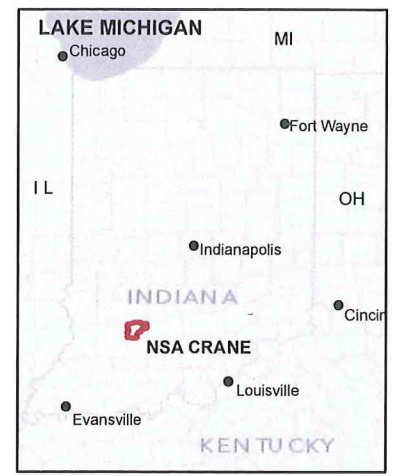
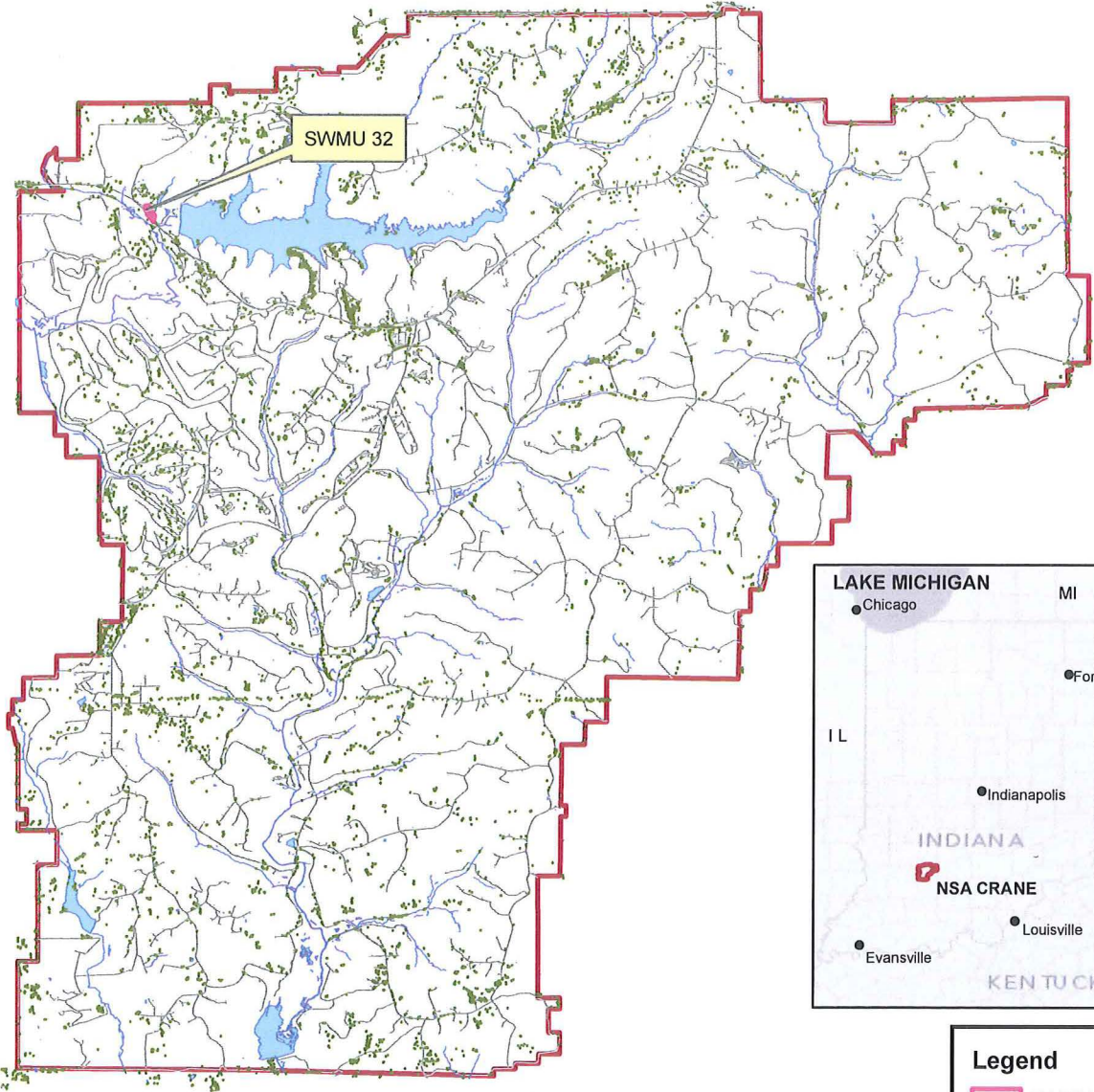
3-1 Benzo(a)pyrene Analytical Results in Excavation Area

**TABLE 3-1**  
**BENZO(A)PYRENE ANALYTICAL RESULTS IN EXCAVATION AREA**  
**SWMU 32 – FORMER FUEL OIL TANK FARM**  
**NSA CRANE, CRANE, INDIANA**

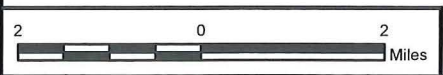
Sample Location	Sample Depth (feet below ground surface)	Benzo(a)pyrene Concentration (ug/kg)
<b>April 2010 Sampling Event</b>		
32SO-12	0 – 2	10.9
	6 – 7	Not Detected (ND)
32SO-13	0 – 2	ND
	6 – 7	ND
32SO-16	0 – 2	ND
	6 – 7	ND
32SO-17	0 – 2	2900
	6 – 7	112
32SO-18	0 – 2	521
	5 – 6	ND
32SO-20	0 – 2	ND
	5 – 6	ND
32SO-21	0 – 2	57.4
	5 – 6	ND
32SO-22	0 – 2	ND
	5 – 6	10.4
32SO-23	0 – 2	31.8
	5 – 6	ND
32SO-45	0 – 2	25.9
<b>September 2010 Sampling Event</b>		
32SO-60	0 – 2	11.5
32SO-61	0 – 2	ND
32SO-62	0 – 2	ND
32SO-63	0 – 2	157
32SO-64	0 – 2	3450
32SO-65	0 – 2	79.1 J
<b>November 2011 Sampling Event</b>		
32SO-66	2 – 4	3.45 J
32SO-67	2 – 4	83.7
32SO-68	0 – 2	336
32SO-69	0 – 2	30.6
32SO-70	0 – 2 (Duplicate)	1090 J
	2 – 4	ND
32SO-71	0 – 2	185
32SO-72	0 – 2	3.05 J
32SO-73	0 – 2	237
32SO-74	0 – 2	ND
32SO-75	0 – 2	23.6
32SO-76	0 – 2	87.1
32SO-77	0 – 2	82.7
32SO-78	0 – 2	16.7
32SO-79	0 – 2	2.79 J
32SO-80	0 – 2	ND
32SO-81	0 – 2	ND
32SO-86	0 – 2	ND

## **Figures**

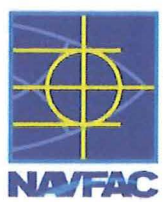
- 1-1 Site Location Map
- 1-2 Vicinity Map
- 1-3 Site Plan
- 3-1 Sample Location Map
- 3-2 Summary of Analytical Results in Excavation Area
- 4-1 Site Development Plan
- 4-2 Excavation Plan
- 4-3 Excavation Cross-Section
- 4-4 Traffic Plan



- Legend**
- SWMU 32
  - Trees
  - Road
  - Base Boundary
  - Water

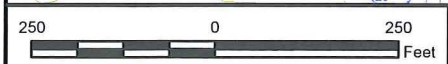
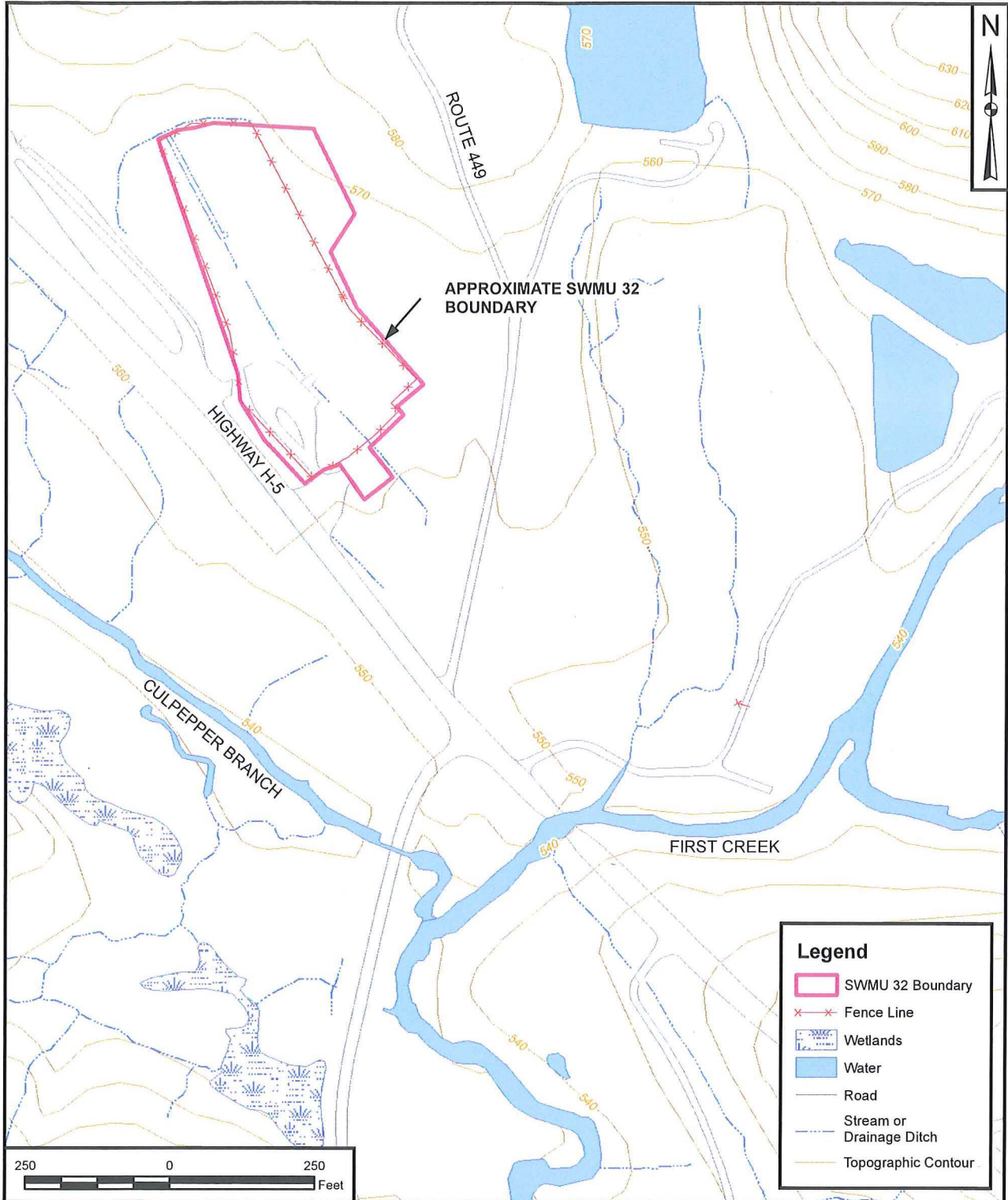


DRAWN BY	DATE
K. MOORE	04/15/09
CHECKED BY	DATE
T. KLIMEK	02/01/12
REVISED BY	DATE
J. ENGLISH	02/24/12
SCALE AS NOTED	



**SITE LOCATION MAP**  
**SWMU 32 – FORMER FUEL OIL TANK FARM**  
**NSA CRANE**  
**CRANE, INDIANA**

CONTRACT NUMBER	CTO NUMBER
F-273	—
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO.	REV
1-1	0



**Legend**

- SWMU 32 Boundary
- x x Fence Line
- Wetlands
- Water
- Road
- Stream or Drainage Ditch
- Topographic Contour

DRAWN BY	DATE
J. NOVAK	02/01/12
CHECKED BY	DATE
K. SMITH	02/24/12
REVISED BY	DATE

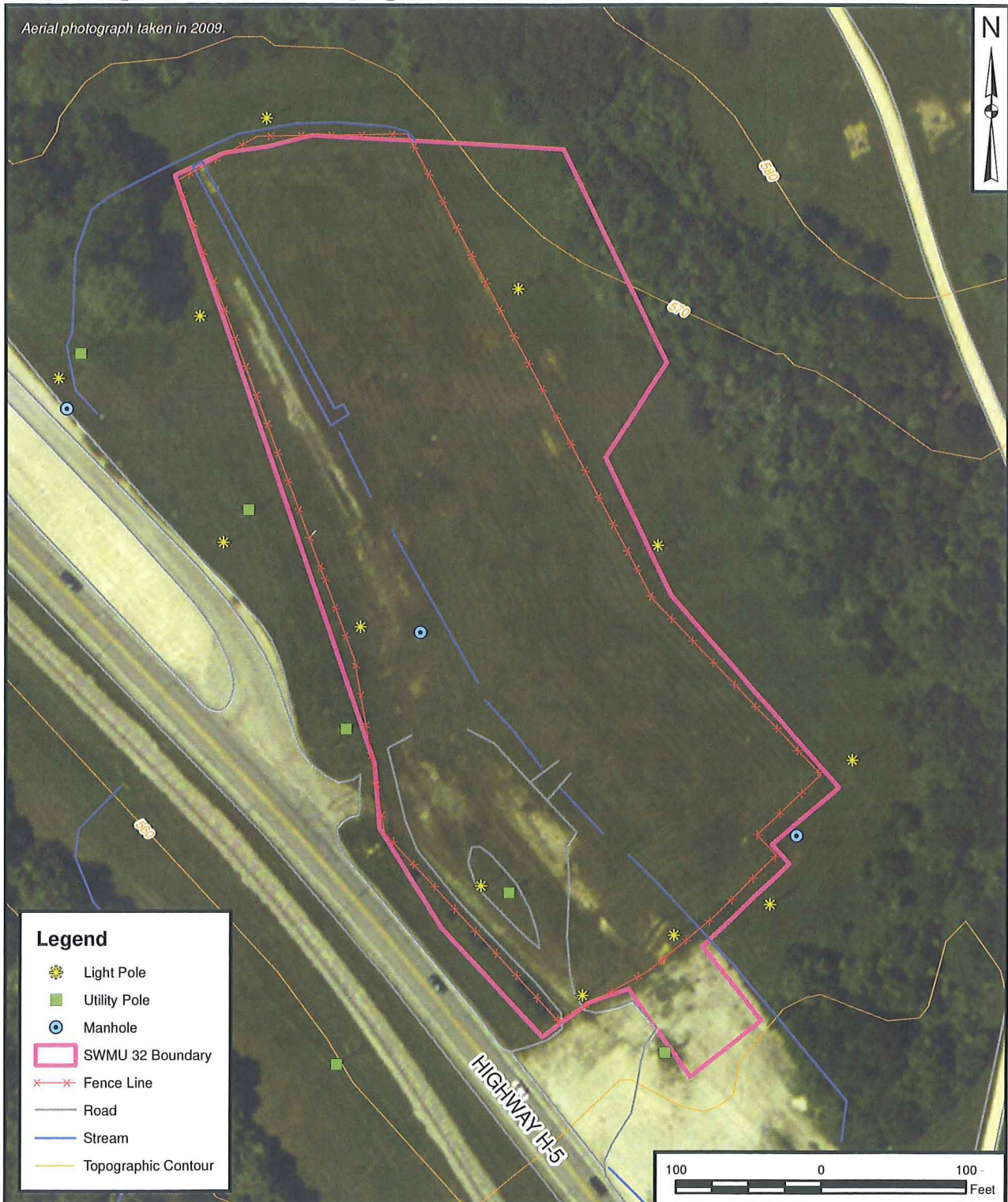


VICINITY MAP  
SWMU 32- FORMER FUEL OIL TANK FARM  
NSA CRANE  
CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
2111	F273
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
1-2	0

SCALE  
AS NOTED

Aerial photograph taken in 2009.



### Legend

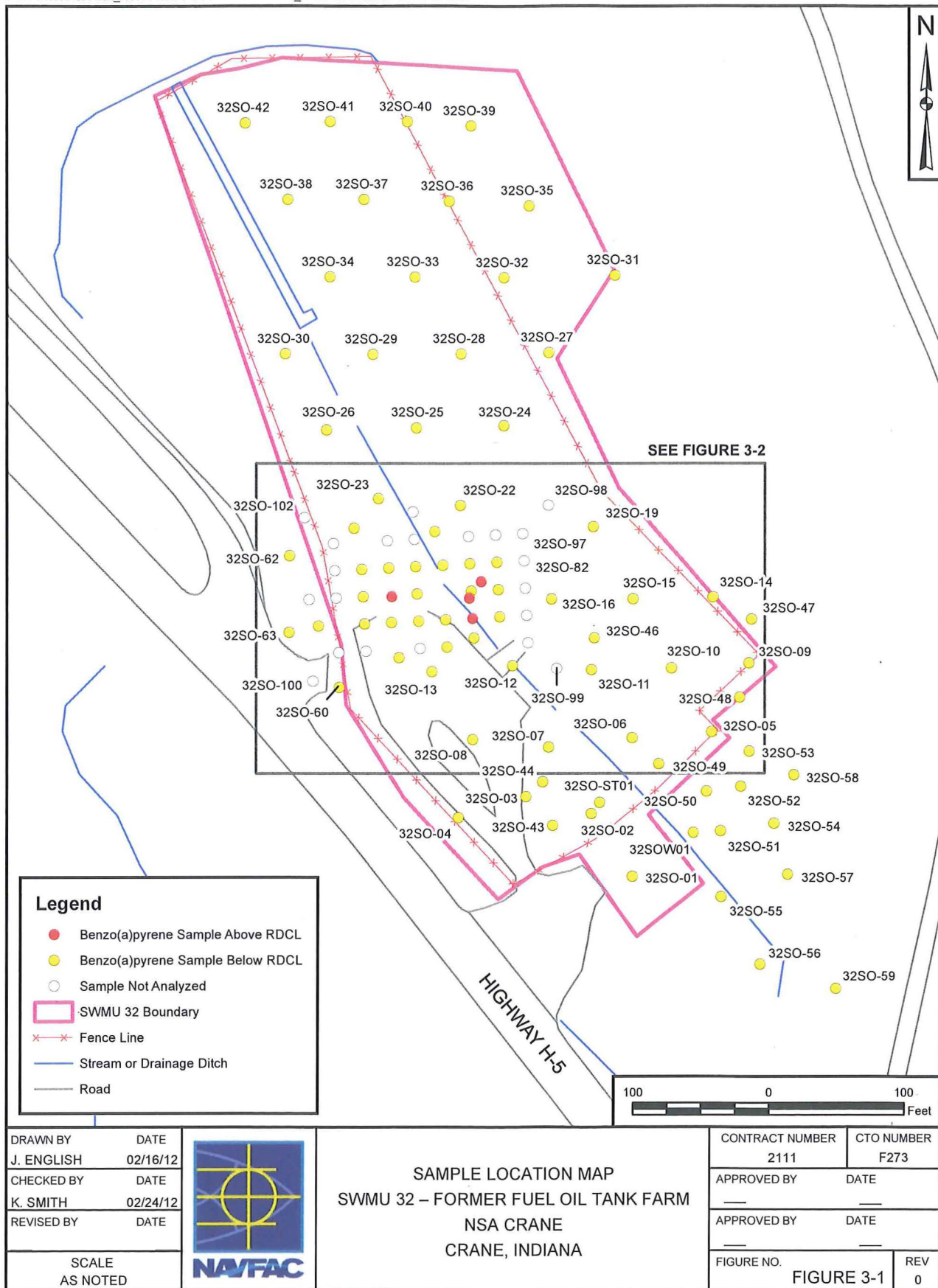
- Light Pole
- Utility Pole
- Manhole
- SWMU 32 Boundary
- Fence Line
- Road
- Stream
- Topographic Contour

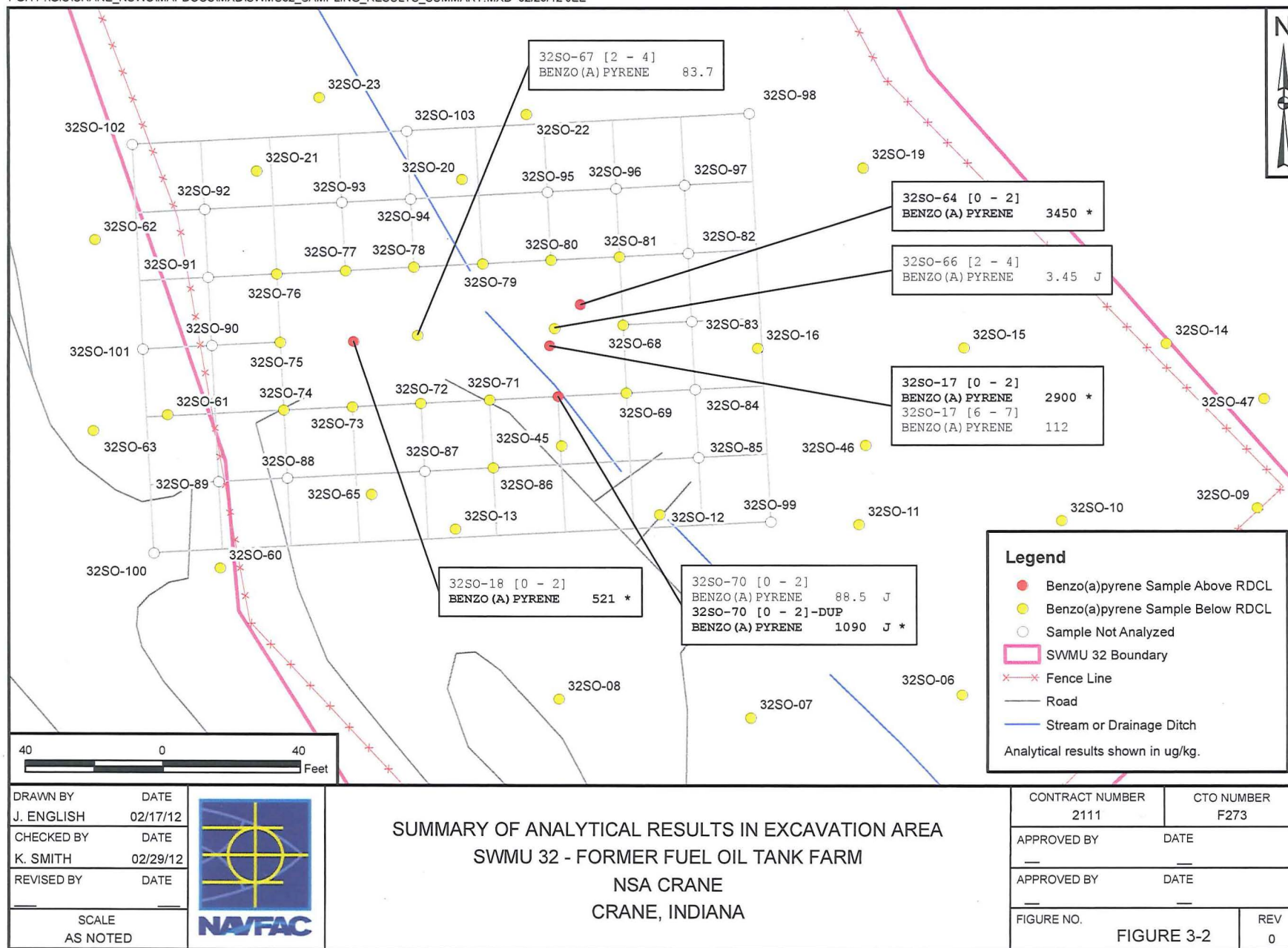
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CHECKED BY	DATE
K. LOSEKAMP	04/13/12
REVISED BY	DATE
S. PAXTON	04/13/12
SCALE AS NOTED	

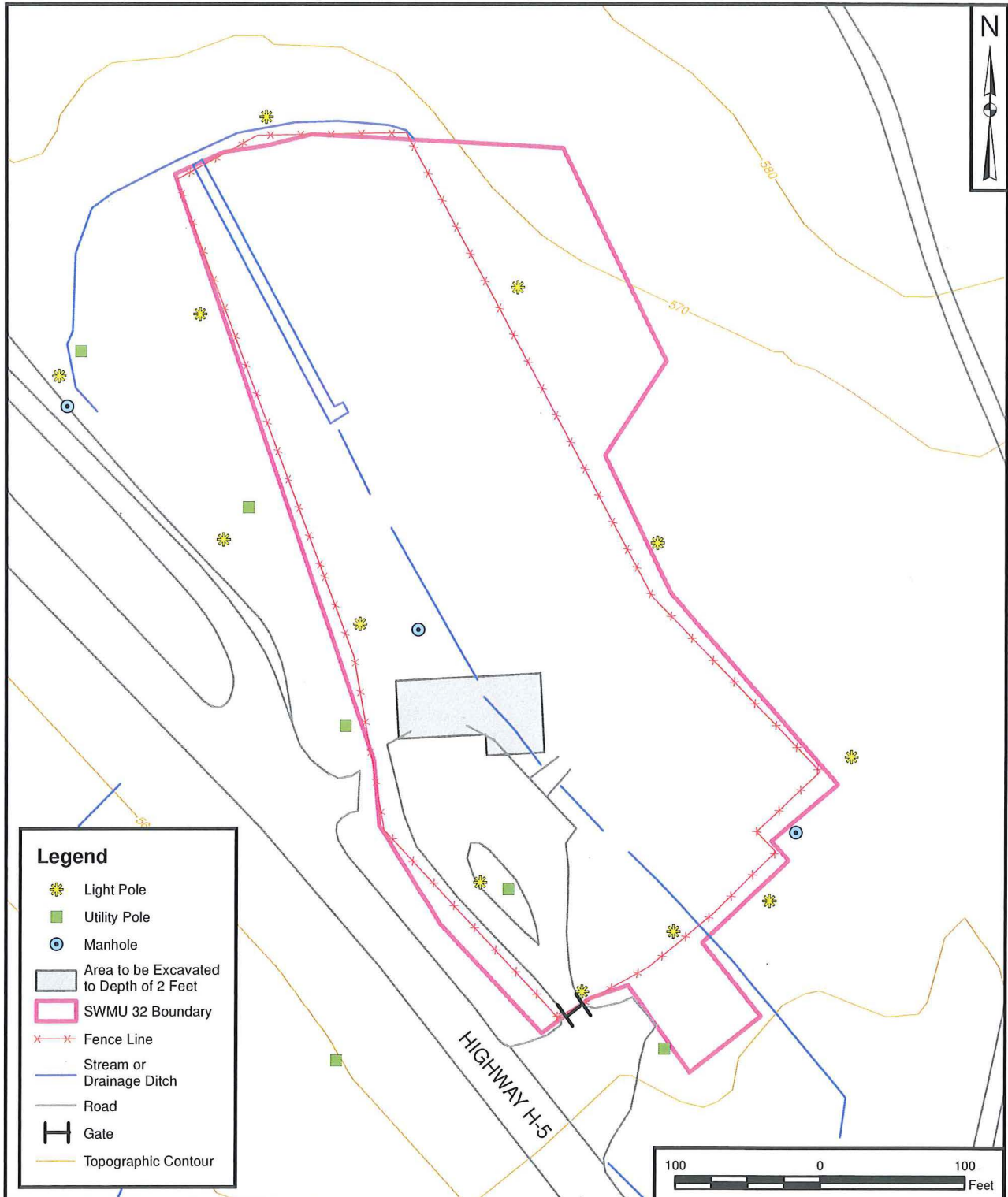


## SITE PLAN SWMU 32 – FORMER FUEL OIL TANK FARM NSA CRANE CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
2111	F273
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE 1-3	0





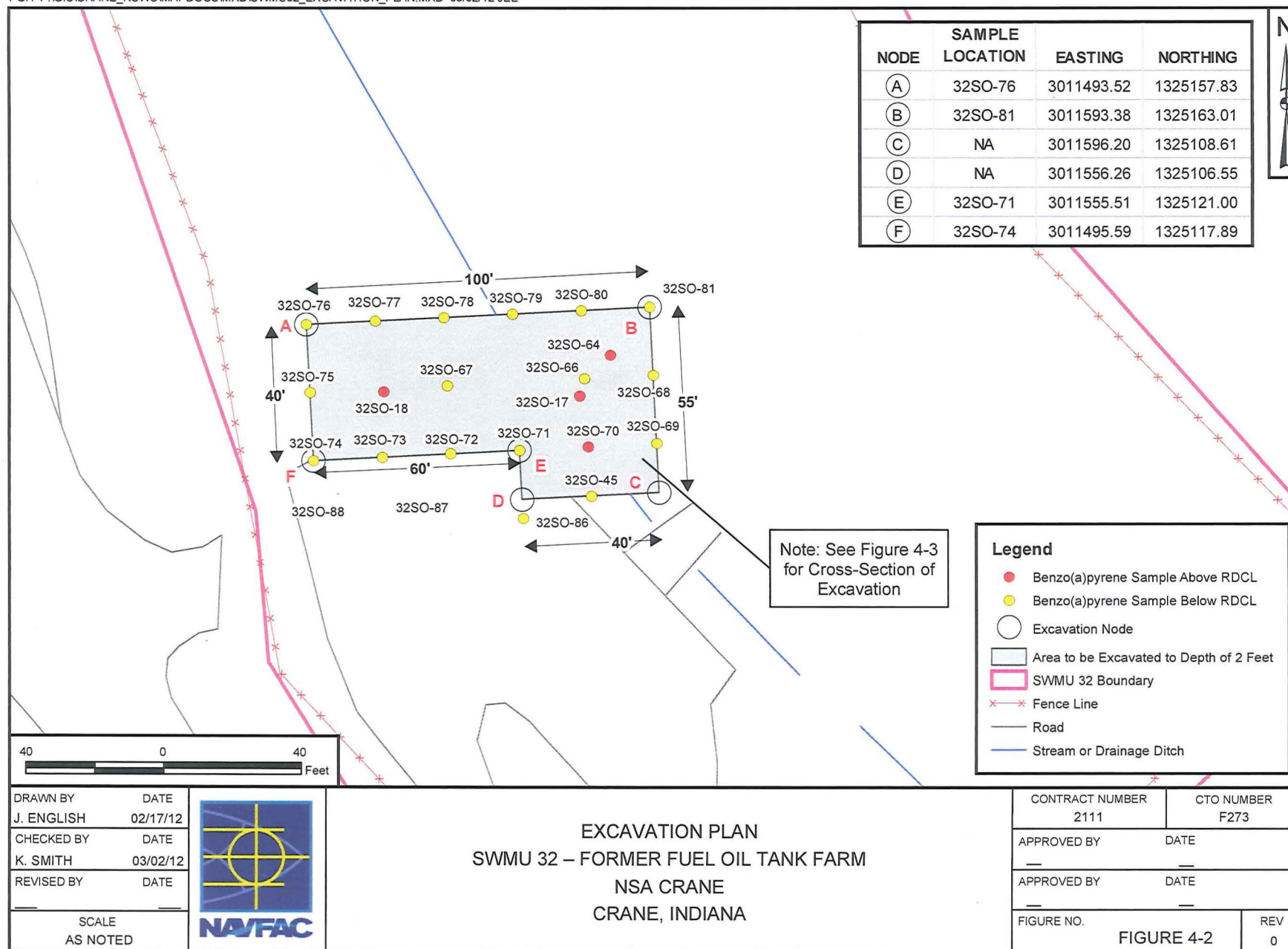


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J. ENGLISH	02/17/12
CHECKED BY	DATE
K. LOSEKAMP	04/13/12
REVISED BY	DATE
S. PAXTON	04/13/12
SCALE	
AS NOTED	

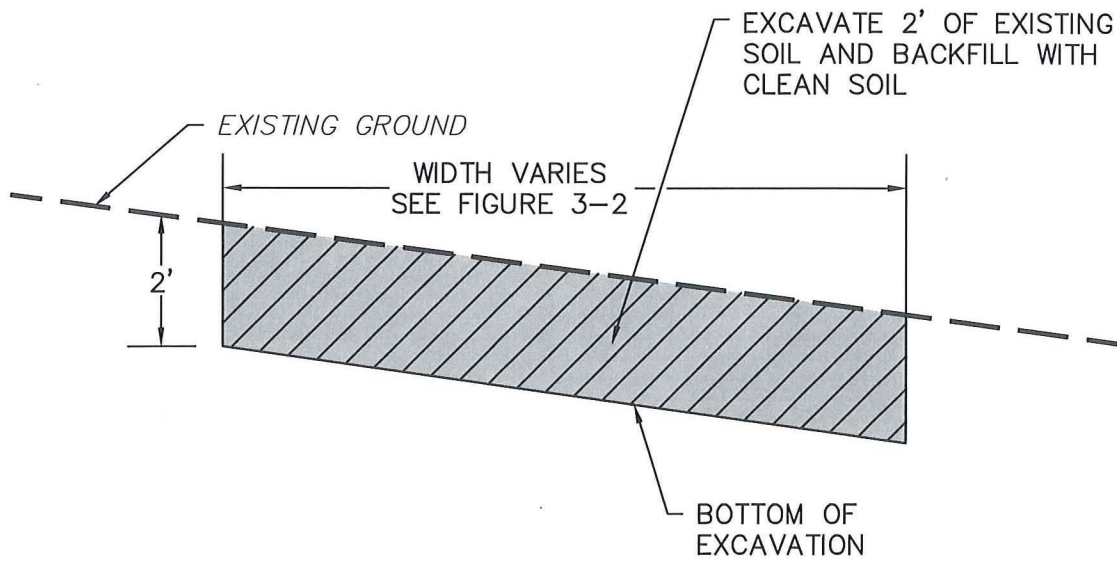


SITE DEVELOPMENT PLAN  
SWMU 32 – FORMER FUEL OIL TANK FARM  
NSA CRANE  
CRANE, INDIANA

CONTRACT NUMBER	CTO NUMBER
2111	F273
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE 4-1	0



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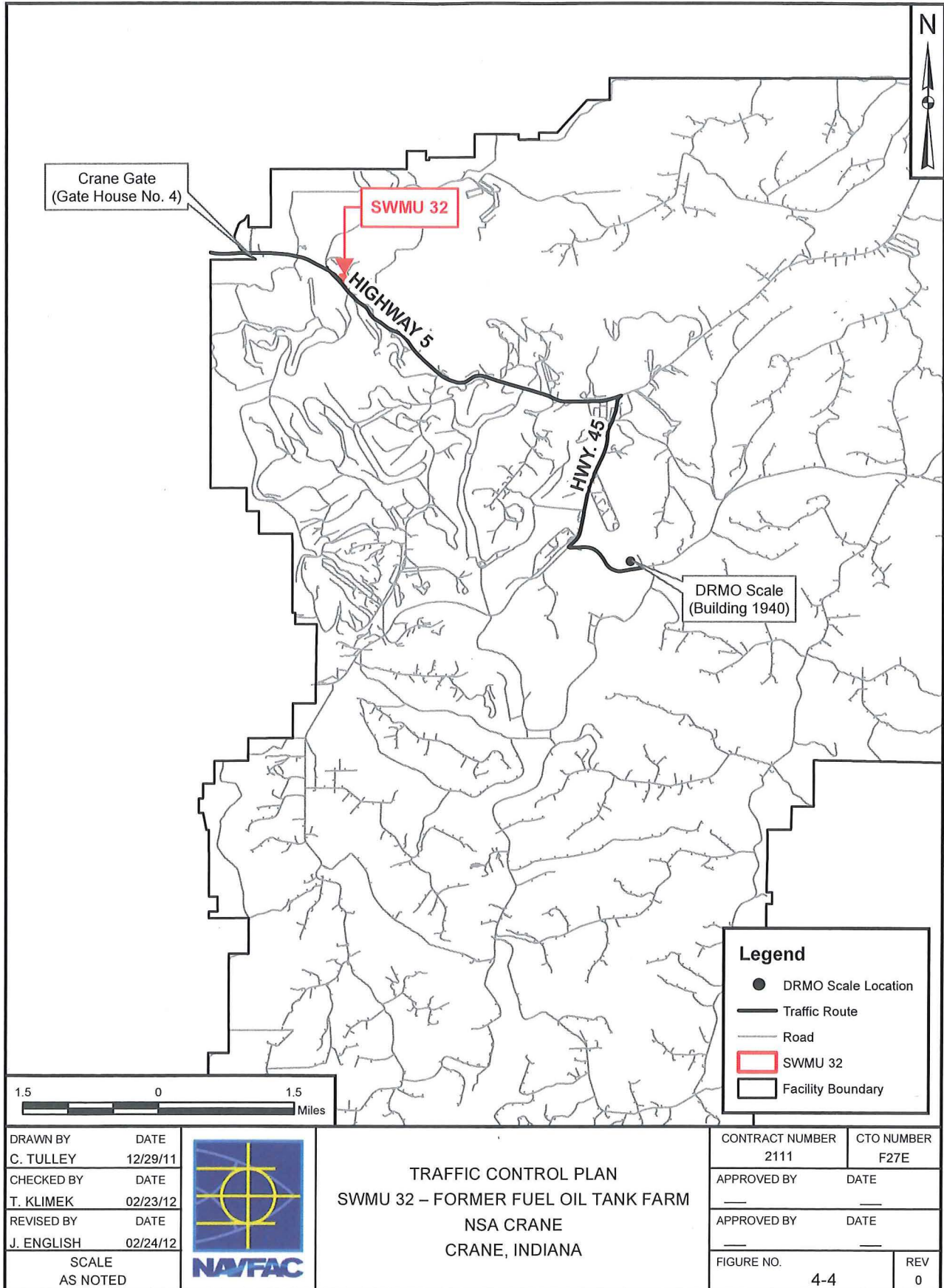
**TYPICAL EXCAVATION CROSS-SECTION**  
NTS

DRAWN BY	DATE
ND	2/16/12
CHECKED BY	DATE
REVISED BY	DATE
SCALE	
NOT TO SCALE	



**EXCAVATION CROSS-SECTION**  
**SWMU 32**  
**FORMER TANK FARM SITE**  
**NSA CRANE**  
**CRANE, INDIANA**

CONTRACT NO.	
F-273	
OWNER NO.	
APPROVED BY	DATE
DRAWING NO.	REV.
<b>FIGURE 4-3</b>	<b>0</b>



## **APPENDIX A – SITE PHOTOS**



<b>Date:</b> 5/14/09	<b>View:</b> N	<b>Photographer:</b> T. Evans
-------------------------	-------------------	----------------------------------

**View of:**  
Main gate entrance on southeast corner looking north from parking area. Excavation area approximately 100 feet north of gate.



<b>Date:</b> 02/21/2012	<b>View:</b> NE	<b>Photographer:</b> K. Smith
----------------------------	--------------------	----------------------------------

**View of:**  
Front view of manhole and approximately 50 feet north of excavation area.



<b>Date:</b> 5/14/09	<b>View:</b> N	<b>Photographer:</b> T. Evans
-------------------------	-------------------	----------------------------------

**View of :**  
Drainage ditch under north fence approximately 250 feet north of excavation area. Drainage flows south through site.



<b>Date:</b> 5/14/09	<b>View:</b> NE	<b>Photographer:</b> T. Evans
-------------------------	--------------------	----------------------------------

**View of:**  
Inside manhole located approximately 50 feet north of excavation area with an outer diameter of 7 feet.



**Date:**  
5/14/09

**View:**  
N

**Photographer:**  
T. Evans

View of light poles and power lines along the former Tank Farm west fence from across Highway H-5.



**Date:**  
5/14/09

**View:**  
NE

**Photographer:**  
T. Evans

Parking area south of south gate from across from Highway H-5.



**Date:**  
5/14/09

**View:**  
S

**Photographer:**  
T. Evans

Northeast of excavation area looking south. Excavation area approximately 200 feet to the south of photographer.



**Date:**  
5/14/09

**View:**  
SW

**Photographer:**  
T. Evans

Northwest of excavation area. Excavation area approximately 150 feet to the south of photographer.

## **APPENDIX B – SUPPLEMENTAL SPECIFICATIONS**

## **SUPPLEMENTAL SPECIFICATIONS**

### **INTERIM MEASURES at SWMU 32** **at** **SWMU 32 FORMER FUEL OIL TANK FARM** **NSA CRANE; CRANE, INDIANA**

#### **1.0 INTRODUCTION**

The Environmental Multiple Award Contract (EMAC) contractor shall perform Interim Measure (IM) excavation work in Solid Waste Management Unit (SWMU) 32 in accordance with the NSA Crane Contractor's Operation Manual and EMAC Basic Contract, and as described in these Supplemental Specifications.

The SWMU 32 site is located in the northwest area of NSA Crane as shown on Figure 1-1. As shown on Figure 4-1, the excavation is within the fenced area of the site approximately 100 feet north of the entrance gate. As shown on Figure 4-2 and 4-3, the area to be excavated covers an area 100 feet long (east-west) and either 40 feet or 55 feet wide (north-south). The depth of the excavation will be two feet. The estimated quantity of contaminated soil to be removed is approximately 350 cubic yards.

The IM work described in these Supplemental Specifications shall include all services necessary to perform the work and work will consist of the following:

- Planning and permitting documents
- Site preparation and support activities
- Soil Excavation
- Transportation and Offsite Disposal of Soil
- Backfill and Restoration
- Summary Report

The IM soil removal activities are shown on Figures 4-1, 4-2, 4-3, and 4-4.

#### **2.0 EMAC CONTRACTOR REQUIREMENTS**

The EMAC contractor will be responsible for performing the following work:

1. Attend on-site project kickoff and implementation conference.
2. Submit planning documents in accordance with the EMAC 'Basic Contract' and as described in these supplemental specifications. Submit draft, draft final and final versions of planning documents; the EMAC contractor shall incorporate Navy comments on the draft and draft-final versions of the documents into subsequent submittals. The draft documents shall be submitted a minimum of 45 days prior to beginning work to allow sufficient time to finalize the documents. These planning documents shall include:
  - Work Plan
    - Soil Excavation Plan
    - Soil Disposal and Transportation Plan
    - Traffic Control Plan
    - Erosion and Sediment Control Plan
  - Site Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis
  - Project Quality Control Plan (QCP)
3. Acquire Facility-specific permits, including but not limited to the following:
  - Safety & Building Availability Permit (ESO 8020/11)
  - Digging Permit (NWSCC 11000/3)
  - Hazards of Electromagnetic Radiation to Ordnance (HERO) (approval for portable radios)

4. Mobilize required equipment and personnel to excavate soil and associated activities.
5. Construct and maintain the required erosion and sediment control devices for the duration of the project.
6. Construct required support facilities including, but not limited to, temporary gravel construction entrance, decontamination pad(s), and material storage areas.
7. Survey and stake excavation area, excavate contaminated soil, and survey limits of excavation.
8. Load, transport and dispose contaminated soil.
9. Backfill excavated area with clean soil.
10. Restore disturbed area with topsoil and blend with surrounding grades.
11. Establish vegetation on topsoil in the excavation area.
12. Remove all temporary support facilities, leaving perimeter erosion and sediment controls in place until revegetation is complete and as instructed by the Navy.
13. Restore areas used for temporary support facilities (regrading and revegetation).
14. Demobilize equipment and personnel.

### **3.0 SUBMITTALS**

#### **3.1 Planning Documents**

Within 30 days of notification to proceed, the EMAC contractor shall submit draft planning documents for review. The Navy will provide comments within 15 days of receipt. The EMAC contractor shall incorporate comments and resubmit the documents within 15 days. The Navy shall then approve the documents or provide additional comments. The Navy must approve the following planning documents before the EMAC contractor mobilizes to the Site.

- Work Plan
- Site Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis
- Project QCP

##### **3.1.1 Work Plan**

The Work Plan shall present details and describe the work for site preparation, soil excavation and offsite disposal, site restoration and all activities necessary to perform the work and include a detailed schedule and sequencing plan. The Work Plan shall include:

- Soil Excavation Plan
- Soil Disposal and Transportation Plan
- Traffic Control Plan
- Erosion and Sediment Control Plan

**Soil Excavation Plan.** The Soil Excavation Plan should discuss the methods used to define, excavate, and dispose the soil offsite. The proposed excavation area is shown on Figures 4-2, and 4-3. The Plan shall describe the method and equipment proposed to remove, stage, and transport the soil. It will also include information about the disposal facility. The plan shall also describe that Tetra Tech will mark the limits of excavation in the field. Confirmation samples will not be collected after excavation has been completed.

The excavated soil may have final approval and/or scheduling with the disposal facility. This may require obtaining and analyzing a representative sample or samples of the material. The Plan shall also address dust control and water management.

**Soil Disposal and Transportation Plan.** The Soil Disposal and Transportation Plan shall describe the transportation and offsite disposal of the soil from SWMU 32. The Plan shall include: 1) Subcontractor for transportation of soil including: name, address, contact name, telephone number, and U.S. Department of Transportation (USDOT) number, and 2) disposal facility name, contact information, permit number, and documentation/certification of the facility to accept the SWMU 32 waste. The EMAC contractor will be responsible to satisfy all transportation and disposal requirements and provide the Navy with all disposal documentation.

**Traffic Control Plan.** The EMAC Contractor shall submit a Traffic Control Plan as part of the Work Plan. The Traffic Control Plan shall present details about travel routes within NSA Crane and describe compliance with security inspection requirements and to minimize interruptions to facility operations. The EMAC contractor vehicles must travel on the roads and use the weighing facilities shown on Figure 4-4. The Traffic Control Plan must function in accordance with the Access and Security requirements and the Traffic and Entry Plan. As shown on Figure 4-4, access to NSA Crane shall be through the Crane Gate (Gate house No. 4) in the northwest. The EMAC contractor is not permitted to travel within restricted areas of the facility. All waste hauling vehicles will be weighed upon arrival and at time of departure using the certified weight scale located at the Defense Reutilization and Marketing Office (DRMO) (Building 1940). The DRMO scale is operated between the hours of 7 AM to 3 PM, and weight tickets are available.

**Erosion and Sediment Control Plan.** The Erosion and Sediment Control Plan must identify erosion and sediment control devices that will be used on-site. Because the disturbed area is relatively small (expected to be less than 0.1 acres) and the minimum disturbed area for a permit is 1 acre, formal approval of an erosion and sediment control plan in accordance with the Indiana Storm Water Quality Manual (Indiana Department of Environmental Management (IDEM) Manual) is not required.

### **3.1.2 Site-Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis**

The SSHSP must conform to the requirements set forth by OSHA and 29 CFR 1910.120 (HAZWOPER), and must address specific anticipated site activities. The SSHSP shall include copies of all 40 Hour 29 CFR 1910.120 Employee Training Certificates for all Contractor employees scheduled to be on site. The plan shall also include a letter documenting that each employee has been medically cleared. A copy of each EMAC Contractor employee's fit test shall be kept on site. Activity Hazard Analysis must address details of the work identified in the Work Plan and discuss the construction phases which require significant or additional activity hazard analysis.

### **3.1.3 Project Quality Assurance / Quality Control (QA/QC) Plan**

The QA/QC Plan shall address the integration of quality into the project. At a minimum it will describe the process the EMAC contractor will use to locate and control the limits of excavation.

## **3.2 Facility-Specific Permits**

The EMAC contractor shall obtain all required permits, including but not limited to the following:

- Safety & Building Availability Permit
- Digging Permit
- Hazards of Electromagnetic Radiation to Ordnance (HERO) (approval for portable radios)

## **3.3 Submittals during Construction**

The EMAC contractor must submit the following documents during construction:

- Field work reports in accordance with EMAC Basic Contract.

- Erosion and Sediment Control installation and inspection logs.
- Copies of NSA Crane specific permits.
- Site plan showing limits of excavation. The site plan shall be stamped by a licensed surveyor.
- Certification and analytical results for backfill material. A minimum of one sample per borrow source is required and must be submitted and approved before material can be brought on-site.
- Waste profiles, waste characterization results, and any waste disposal facility pre-approval or approval documentation.
- Work Site Decontamination Certificates (verification that all vehicles equipment and containers were properly decontaminated prior to leaving the work site).
- Disposal Site Decontamination Certificates (verification that vehicles and containers were decontaminated prior to leaving the disposal facility).
- Shipment Manifests (manifests and other documents required to ship waste).
- Delivery and Disposal Certificates (verification that waste was received and disposed at identified disposal facility).
- Decontamination Log.

The EMAC contractor shall compile the above documentation in a Construction Completion Report and provide it to the Navy. The EMAC contractor shall provide the Navy, or their representative, all documentation within 30 days of demobilization from the Site.

#### 4.0 ON-SITE PERSONNEL REQUIREMENTS

All EMAC Contractor personnel working on-site must have completed the 40-hour HAZWOPER training under 29 CFR 1910.120 (e) and have current annual 8 hour refresher training. In addition, the following key personnel shall perform the roles and meet specific requirements as described herein.

- Site Superintendent
- Project Quality Control Manager
- Site Health and Safety Specialist

**Site Superintendent.** The Site Superintendent shall have responsibility and authority to direct work performed. The Site Superintendent shall be responsible for the management and execution of all site activities in accordance with these Supplemental Specifications, approved Work Plan, and all Federal, State, and local laws and regulations. The Site Superintendent may not also serve as the Project Quality Control (QC) Manager or Site Health and Safety Specialist (SHSS). The Site Superintendent shall have, as a minimum, the following qualifications:

- A minimum of 6 years site superintendent experience.
- A minimum of 3 years experience on hazardous, toxic, and radioactive waste (HTRW) projects.
- Familiar with the requirements of the U.S. Army Corps of Engineers Safety and Health Requirements (EM 385-1-1).
- Experience in the areas of hazard identification and safety compliance.

**Project Quality Control Manager.** The Project QC Manager who shall assist and represent the QC Program Manager in continued implementation and enforcement of the approved Project QC Plan. The QC Program Manager or Project QC Manager shall be physically present at the project site whenever work is in progress. The Project QC Manager may also serve as the SHSS, if qualified. The Project QC Manager shall have, as a minimum, the following qualifications:

- A minimum 2 years experience as a Project QC Manager.
- A minimum of 10 years combined experience in the following positions: project superintendent, QC manager, project manager, project engineer or construction manager on similar size and type of construction contracts that included the major trades that are part of this IM.
- Alternatively, the above 10 year combined experience requirement may be satisfied by a professional engineer registered in the State of Indiana that has at least 2 years experience as a Project QC Manager.
- Familiarity with the requirements of the U.S. Army Corps of Engineers Safety and Health Requirements (EM 385-1-1).
- Experience in the areas of hazard identification and safety compliance.

**Site Health and Safety Specialist.** The SHSS shall assist and represent the EMAC contractor's Health and Safety (H/S) Manager in continued implementation and enforcement of the approved Specific Site Health and Safety Plan (SSHSP). The SHSS shall have the on-site responsibility and authority to modify and stop work, or remove personnel from the site if working conditions change which may affect on-site and off-site health and safety. The SHSS shall be physically present at the project site at all times. The SHSS may be dual hatted with the Project QC Manager. The SHSS shall have, as a minimum, the following qualifications:

- A minimum of 5 years safety work experience on similar projects.
- A 30-hour OSHA construction safety class or equivalent within the last 5 years.
- An average of at least 24 hours of formal safety training each year for the last 5 years.
- Competent person status for at least the following:
  - Confined Space Entry
  - Health hazard recognition, evaluation and control of chemical, physical and biological agents
  - Personal protective equipment and clothing to include selection, use, and maintenance
- First aid and cardiopulmonary resuscitation (CPR) qualified.

## 5.0 GENERAL REQUIREMENTS

This project is subject to Federal, State, and local regulatory agency inspections and review for compliance with environmental laws and regulations. The EMAC contractor shall fully cooperate with any representative from any Federal, State, or local regulatory agency who may visit the job site and shall provide immediate notification to the Officer in Charge of Construction (OICC), who shall accompany them on any subsequent site inspections. The EMAC contractor shall complete, maintain, and make available to the OICC, Facility, or regulatory agency personnel all documentation relating to environmental compliance under applicable Federal, State, and local laws and regulations. The EMAC contractor shall immediately notify the OICC if a Notice of Violation, Notice of Deficiency, or similar regulatory notice is issued to the EMAC contractor.

The EMAC Contractor shall be responsible for all damages to persons or property resulting from EMAC contractor fault or negligence as well as for the payment of any civil fines or penalties which may be assessed by any Federal, State, or local regulatory agency as a result of the EMAC contractor's or any EMAC Contractor's violation of an applicable Federal, State, or local environmental law or regulation. Should a Notice of Violation, Notice of Noncompliance, Notice of Deficiency, or similar regulatory agency notice be issued to the Government or Facility owner/operator on account of the actions or inactions of the EMAC contractor or one of its subcontractors in the performance of work under this contract, the EMAC contractor shall fully cooperate with the Government in defending against regulatory assessment of any civil fines or penalties arising out of such actions or inactions.

After approval of the EMAC Contractor's Work Plan and before commencement of work the EMAC contractor shall submit to the OICC the required certifications. As requested by the OICC, the Navy Representative for this project may review and provide surveillance for the OICC to determine if EMAC contractor's submittals comply with the contract requirements.

The EMAC contractor shall be required to commence work on the approved EMAC contractor's Work Plan within 5 calendar days after receiving the notice to proceed and to prosecute the work diligently after receiving the notice to proceed.

NSA Crane will remain in operation during the entire construction period. The EMAC contractor shall schedule the work as to cause the least amount of interference with the Facility. Work schedules shall be subject to the approval of the OICC. Permission to interrupt Facility road services shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption. The OICC shall be notified 48 hours prior to starting demolition and/or excavation activities.

Regular work hours shall consist of an 8-1/2 hour daily period established by the OICC, Monday through Friday, excluding Government holidays. The EMAC contractor should assume an 8-1/2 hour daily period. Working outside of the 8-1/2 hour daily period will require approval by the OICC. Work hours shall be established during the pre-IMWP implementation conference.

On-site storage, laydown, material handling, and decontamination activities shall be limited to areas approved by the OICC.

During the progress of construction activities, the work area and adjacent areas shall be kept clean and free of rubbish, surplus materials, and unneeded construction equipment. No material or debris shall be allowed to flow or wash into watercourses, ditches, gutters, drains, or pipes. Upon completion of the work, the EMAC contractor shall sweep paved areas and rake clean landscaped areas, and remove waste and surplus materials, rubbish, and construction facilities from the site.

#### **5.1 Work Restrictions**

EMAC contractor personnel employed at the Facility shall become familiar with and obey Facility regulations and keep within the limits of the work and avenues of ingress and egress as directed. EMAC contractor and subcontractor personnel shall not enter any restricted areas unless required to do so and until cleared for such entry. The EMAC contractor's equipment shall be clearly marked for identification.

The EMAC contractor shall indicate on the construction schedule any activity that could potentially interrupt Facility operations. The EMAC contractor shall notify the OICC in writing 15 calendar days prior to the required interruption.

#### **5.2 Facilities and Services**

The EMAC contractor shall provide utility permits in accordance with the Basic Contract.

NSA Crane shall make all reasonably required amounts of utilities available to the EMAC Contractor from existing outlets and supplies, as indicated. The amount of each utility service consumed shall be charged to or paid for by the EMAC Contractor at the prevailing rates charged to NSA Crane or shall be furnished at no charge at the discretion of the Facility. The EMAC Contractor shall carefully conserve any utilities furnished.

The location(s) at which NSA Crane will deliver such utilities or services and the quantity available will be identified by NSA Crane.

The EMAC contractor, at its expense and in a workmanlike manner satisfactory to the OICC, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the EMAC contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

Electric – Electrical power available: primary voltage is 2400 volt, 3 phase, 3 wire, 60 cycle AC; secondary voltages may be 120/208 or 120/240 volts. Final taps and tie-ins to the NSA Crane utility grid will be made by the NSA Crane electric shop.

**Potable Water** – Potable water shall be made available to the EMAC contractor at the discretion of the Facility. The EMAC contractor shall provide backflow preventer devices on connections to potable water supplies. Under no circumstances will taps to NSA Crane fire hydrants be allowed for obtaining water. The OICC shall identify available potable water supply locations.

**Telephone** – Facility telephone service is not available to the EMAC contractor.

**Sanitary Facilities** – The EMAC contractor shall provide temporary sanitary facilities for use by all personnel in accordance with the Basic Contract.

**Municipal Waste** – Facility municipal waste storage and disposal is available to the EMAC contractor. The disposal of the soil will be to an offsite facility.

**Sewer** – Wastewater resulting from personnel and equipment decontamination, excavation dewatering, and water collected in the materials handling pad(s) may be discharged to the NSA Crane wastewater treatment system, subject to the approval of NSA Crane based on characterization of the water to be discharged.

### **5.3 Quality Control**

Approval of the QC Plan is required prior to the start of construction. The plan shall include the process to locate and verify the limits of excavation. The OICC reserves the right to require changes in the QC Plan and operations as necessary to ensure the specified quality of work. The OICC reserves the right to interview the QC Manager at any time in order to verify their submitted qualifications.

The OICC shall be notified in writing of any proposed changes to the QC Plan, at a minimum of 7 calendar days prior to the implementation of the proposed change. Proposed changes must be approved by the OICC.

Combined Contractor Production Report/Contractor Quality Control Report (CPR/CQCR) is required for each day that work is performed. CPR/CQCRs are to be prepared, signed, and dated by the Project QC Manager.

### **5.4 Safety and Occupational Health Requirements**

The SHSS and EMAC contractor representatives who have a responsibility or significant role in accident prevention shall attend the pre-IMWP implementation conference. The purpose of the conference is for the EMAC contractor and the OICC to become acquainted and explain the functions and operating procedures of their respective organizations and to reach mutual understanding relative to the administration of the overall project before the initiation of work. The EMAC contractor shall discuss the details of the work identified in the approved EMAC contractor's Work Plan and discuss which construction phases will require significant or additional activity hazard analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of additional hazard analysis shall be established to preclude project delays. Lastly, deficiencies in the submitted accident prevention report will be brought to the attention of the EMAC contractor at the conference. The EMAC contractor shall revise the plan to correct deficiencies and resubmit the plan for acceptance.

New project employees (prime or subcontractor) will be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

If unforeseen materials hazardous to human health are encountered during operations, that portion of the work shall be stopped and the OICC shall be notified immediately. Within 14 days, the Navy will determine if the material is hazardous. If the material is not hazardous or poses no danger, the OICC will direct the EMAC contractor to proceed without change. If the material is determined to be hazardous or to pose danger, and handling of the material is necessary to accomplish the work, the Contracting Officer will issue modifications to the proposed work.

Equipment shall be operated by designated qualified operators. Proof of qualifications shall be kept on the project site for review. Manufacturer's specifications or owner's manuals for the equipment shall be

on site and reviewed for additional safety precautions or requirements. Such additional safety precautions or requirements shall be incorporated into the activity hazard analysis. Mechanized equipment shall be inspected in accordance with the manufacturer's recommendations for safe operations by a competent person prior to being placed into use. Daily checks or tests shall be conducted and documented on mechanized equipment by designated competent persons.

## **5.6 Environmental Controls**

The EMAC contractor must prepare and implement an Erosion and Sediment Control Plan. The Erosion and Sediment Control Plan shall describe the location and description of all erosion and sediment control measures, a sequence of construction to be followed, graphic details of all erosion and sediment control measures to be used, and an approval sign-off block containing the names of the Facility and EMAC contractor contacts, whose signatures indicate plan acceptance/approval.

The EMAC contractor shall strictly follow the Erosion and Sediment Control Plan and maintain all measures used during construction. Modifications to the Erosion and Sediment Control Plan shall be submitted to the OICC for approval. No modifications to the Erosion and Sediment Control Plan will be allowed until these changes have been approved by the OICC and three copies of the approved modifications have been submitted to the OICC.

## **5.7 Transportation and Disposal of Contaminated Soil**

The EMAC contractor shall be solely responsible for complying with all Federal, State, and local requirements for decontamination of vehicles, equipment, and containers and shall bear all responsibility and cost for any noncompliance. In addition to these requirements, the EMAC contractor shall perform the following:

- Visually inspect all vehicles, equipment, and containers leaving the work site for proper decontamination.
- Prepare and maintain a written decontamination log.

The EMAC contractor shall be solely responsible for complying with all Federal, State, and local requirements for transporting contaminated materials through the applicable jurisdictions and shall bear all responsibility and cost for any noncompliance. In addition to these requirements, the EMAC contractor shall perform the following:

- Inspect and document all vehicles and containers for proper operation and covering.
- Inspect all vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.

All contaminated materials removed from the site shall be disposed in a disposal facility permitted to accept such material and with the approval of the OICC.

The EMAC contractor shall properly dispose of investigation derived waste, personnel protective equipment, and miscellaneous wastes associated with implementation of the IMWP, including sampling and analysis wastes that are generated by the Navy representatives.

## **6.0 EMAC CONTRACTOR SCOPE-OF-WORK**

The EMAC Contractor shall be responsible for all interim measures as described as follows:

### **6.1 Planning and Permitting**

The EMAC contractor shall prepare planning documents and obtain necessary site permits prior to performing the work. The planning documents will include:

- Work Plan
- Site Specific Health and Safety Plan (SSHSP) and Activity Hazard Analysis
- Project Quality Control Plan (QCP)

The EMAC contractor shall obtain all required permits, including but not limited to the following:

- Safety & Building Availability Permit
- Digging Permit
- Hazards of Electromagnetic Radiation to Ordnance (HERO) (approval for portable radios)

## **6.2 Mobilization**

Mobilization shall include all activities and associated costs for transportation of personnel, equipment, and operating supplies to the Site and establishment of offices, buildings, and other necessary general facilities for the EMAC contractor's operations at the Site.

The EMAC contractor must mobilize all personnel and equipment in accordance with the approved Traffic Plan described in the Work Plan (Section 3.0 of this SOW).

## **6.3 Site Preparation**

The EMAC contractor shall set up entrances and exits to the Work Area, decontamination areas, and a staging area in a manner that minimizes disturbance of the area. The entrance and exit location will be the gate entrance in the southwest corner of the site. The EMAC Contractor will identify a proposed location for staging equipment; this area should be selected to minimize disturbance. The entrances, exits, and staging areas must be approved by the Navy prior to mobilization.

A temporary decontamination pad will be set up to clean equipment used to excavate, load, and transport contaminated soil. The pad must be located within 100 yards of the excavation area. The pad will be sized to accommodate all the equipment to be used at the Site and will be constructed in a manner that contains all the contaminated materials removed from equipment and the liquids used to clean the equipment. Contaminated materials removed from the equipment will be disposed offsite with the soil. Care will be taken to keep off-road transport equipment clean to minimize the spread of contamination soil to areas adjacent to the excavations or the temporary roads.

The staging area must be designed and built to control runoff and minimize erosion during the period when materials are staged. Care must be taken to avoid and reduce damage to the area. Many areas of the Site have thin soil; disturbed and damaged areas shall be repaired and restored to original condition at completion of the project.

The EMAC contractor shall install and maintain fencing to secure the work area for the duration of the project. Access shall be controlled during both work and non-work hours. The EMAC Contractor shall remove fencing at the completion of the project.

The EMAC contractor shall establish a "Clean" area on a portion of the Site using imported fill or stone where excavation work is not anticipated to take place. A haul road may be established on Site using imported fill or stone to reduce the need for decontamination of vehicles as they exit the Site.

## **6.4 Erosion and Sediment Control**

Erosion and sediment control measures shall be implemented to reduce or eliminate erosion and sedimentation of soil. The site slopes to the south and southeast. The EMAC Contractor shall construct erosion control at any location necessary to prevent runoff or erosion of soil or debris from any excavated soil, stockpiled debris, or work surfaces. Erosion control measures must be inspected and repaired daily. After the Erosion and Sediment Control Plan is approved, no changes can be made without the approval of Navy.

Based on the type of field activities being implemented during the SWMU 32 interim measures work, the proposed erosion and sediment control measures must include the following, at a minimum:

- Silt fence – A silt fence shall be installed downgradient from excavation area
- Gravel Construction Entrance - Placed as a controlled site entrance to reduce the amount of sediment transported by construction vehicles onto facility and public roads.

- Surface Stabilization - Permanent seeding shall be used to stabilize disturbed areas.

The EMAC Contractor shall prepare an Erosion and Sediment Control Plan. The construction, implementation, and maintenance of these erosion and sediment control devices and permanent seeding will be in accordance with the IDEM Manual. Dust control must be addressed in the EMAC Contractor's Work Plan.

In general, all erosion and sediment control measures will be checked daily and after each runoff-producing rainfall event. Any required repairs will be made immediately. The following items will be checked during each inspection:

- Silt fence will be checked for undermining or deterioration of the fabric. Sediment will be removed when the level of sediment causes bulging or reaches one-half of the fabric height.
- Gravel construction entrance will be maintained to minimize tracking of sediment onto facility or public roads.
- Seeded areas will be checked regularly to ensure that a good growth of vegetation is maintained, and these areas will be fertilized and reseeded, as needed.
- The fuel and lubricant materials storage area will be checked to ensure that stored containers are not leaking and that the lining system is functioning properly.

All erosion and sediment control devices will be inspected and maintained until the Navy has formally accepted the permanent stabilization of the disturbed areas. The EMAC contractor will maintain a logbook of all erosion and sediment control device inspections and maintenance. This logbook will be available at the Site at all times for inspection by Navy.

Erosion control structures shall be adequate to sustain weather damage and degradation, and shall be maintained by the EMAC contractor until site restoration has provided new vegetation or backfill adequate to stabilize remaining soils in-place on the surface of the ground which has been worked by the contractor. Completion of stabilization will be determined by the Navy.

## **6.5 Soil Excavation**

This work will consist of excavating soil that has benzo(a)pyrene contamination that exceeds the Residential Default Closure Levels (RDCLs) as shown on Figures 4-2 and 4-3. Tetra Tech will stake the limits (corners) of excavation in the field prior to excavation. The EMAC contractor will be responsible to maintain the corner stakes and excavate within the required limits. As shown on those figures, the area to be excavated covers an area 100 feet long (east-west) and either 40 or 55 feet wide (north-south). The depth of the excavation will be two feet.

The actual method to excavate the soil will be determined by the EMAC contractor and described in the Work Plan. The excavated soil will be pending final approval and/or scheduling with the disposal facility. This work will include dust control, water management, and compliance with OSHA requirements.

## **6.6 Transportation and Offsite Disposal of Soil**

The EMAC contractor shall provide all transportation and disposal of contaminated soil as described in the Work Plan.

The EMAC contractor shall provide an appropriate number of off-site disposal trucks during shipping periods in accordance with the Traffic Plan described in the Work Plan. Disposal vehicles shall only arrive and leave the Site during site working hours (as described in the Traffic Plan) to comply with security inspection requirements and to minimize interruptions to Facility operations. All waste-hauling vehicles will be weighed upon arrival and at time of departure using the certified weight scale located at the Defense Reutilization and Marketing Office (DRMO) - Building 1940. The DRMO scale is operated between the hours of 7 AM to 3 PM, and weight tickets are available. The DRMO scale is the preferred

scale for the EMAC contractor's use. The EMAC contractor shall adhere to haul routes as described in the approved Traffic Plan.

The EMAC contractor shall ensure that all off-site disposal trucks are equipped with appropriate appurtenances (e.g., liners and tarps) in acceptable working condition. All loads must be covered prior to departure. The EMAC contractor shall ensure that all liners and covers are properly secured and that the vehicles are not leaking or releasing any waste constituents at any time.

Drivers of the off-site disposal trucks must not come in physical contact with the contaminated material while covering the load or preparing it for transport. The EMAC contractor shall load off-site disposal trucks in an area designated in the Work Plan.

The EMAC contractor shall be responsible for providing and carrying waste manifests, bills of lading, placards, labeling, markings, licensing, and any other transportation/disposal documentation as required by federal, state, and local regulations. The Navy will supply an EPA Generator Identification number for this documentation. The EMAC contractor shall supply and prepare all transportation documentation, including bills of lading, manifests, etc. for approval and signature by the Navy. A representative of the Navy will sign completed shipping manifests and bills of lading.

The EMAC contractor shall provide the Navy a two week notice prior to mobilization to the Site and a minimum of 48 hour notice (2 business days) prior to shipping waste materials from the Site.

## **6.7 Site Restoration**

Upon completion of work, the EMAC contractor shall restore all excavated areas on-site and all disturbed areas.

### **6.7.1 Backfill Materials and Testing**

Excavation areas will be backfilled to pre-construction grades. The backfill soil obtained from a borrow source shall have properties similar to the native SWMU 32 soil. The backfill soil (common fill and topsoil) will come from sources where due diligence shows no evidence of a release of a regulated substance has occurred (i.e., clean fill). A certification must be provided regarding the origin of the backfill soil, including a statement that, to the best of the provider's knowledge, the backfill soil has not been contaminated through the release of regulated substances. The backfill soil will be subject to analytical testing to assure that the material satisfies the following requirements:

- Total Petroleum Hydrocarbon (TPH), diesel range organics (DRO), USEPA Method SW-846 8015M DRO - less than 1 mg/kg.
- TPH, gasoline range organics (GRO), USEPA Method SW-846 8015M GRO - less than 1 mg/kg.
- Sum of benzene, toluene, ethylbenzene, and xylenes, USEPA Method SW-846 5030/8021 - less than 1 mg/kg.
- Total polychlorinated biphenyls (PCBs), USEPA method SW-846 8082 – Less than 1 mg/kg
- 4,4'-DDD, USEPA method SW-846 8081 - Less than 3.2 µg/kg
- 4,4'-DDE, USEPA method SW-846 8081 - Less than 3.2 µg/kg
- 4,4'-DDT, USEPA method SW-846 8081 – Less than 3.2 µg/kg
- Dieldrin, USEPA EPA method SW-846 8081 – Less than 3.2 µg/kg

- Heptachlor, USEPA method SW-846 8081) – Less than 1.5 µg/kg
- Alpha-chlordane, USEPA method SW-846 8081 – Less than 1.5 µg/kg
- Gamma-chlordane, USEPA method SW-846 8081 – Less than 1.5 µg/kg
- Lead, USEPA Method SW-846 6010B or 6020 – less than 400 mg/kg (US EPA Residential Screen Level and IDEM Direct Contact Screening Level)

#### 6.7.2 Backfill and Grading

Two types of backfill material are required for site restoration, common fill, and topsoil. The physical characteristics required for each type of backfill material are described below.

**Common Fill.** Common fill will be used to backfill all excavation areas to a depth of 6 inches below final grade. This material will be placed into the excavation in maximum 9-inch-thick lifts and compacted to 90% of standard proctor density and compacted by track-walking across 100 percent of the backfilled area with track-type equipment, using the bucket of a backhoe, or other Navy approved method. Common fill will meet the following physical characteristics:

- American Society for Testing and Materials (ASTM) D 2487, group symbols GW, GP, GM, SW, SP, or SM.
- ASTM D 4318, liquid limit, 35 maximum.
- ASTM D 4318, plasticity index, 12 maximum.
- Maximum of 25 percent by weight passing ASTM D 1140, No. 200 sieve.
- Maximum particle size of 1 inch.

**Topsoil.** The uppermost 6 inches of backfill used to establish final grades will be medium-textured loam suitable for establishing vegetation.

Materials specifications and test results shall be submitted to the Navy.

The EMAC Contractor shall provide all permits, tests, labor, materials, and equipment to restore the excavation area to the adjoining grade. The scope includes, but is not limited to the following:

- Following placement of common fill, place topsoil in a 6-inch thick minimum layer to finished grade.
- Grade topsoil to a smooth surface that will allow proper drainage, and will prevent ponding of surface water runoff.
- Restore areas that have been disturbed and damaged (ruts or scarring in the soil) during the work to original condition.
- Revegetate topsoil areas in accordance with Soil Preparation and Seeding
- Protect revegetated areas from pedestrian and vehicular traffic using signs and/or temporary barriers.
- Maintain or install new appropriate erosion and sediment control measures for the soil excavation area and disturbed areas.

#### 6.7.3 Soil Preparation and Seeding

The disturbed area will be restored/stabilized using appropriate topsoil and permanent seeding. Topsoil shall be spread and dressed to finished grade leaving no irregularities or depressions and so as to promote positive drainage. Revegetation shall occur within 24 hours of topsoil placement. Permanent vegetation activities include site/seed bed preparation, seeding, and in conformance with Chapter 7 of the IDEM Manual.

The seed mixture recommended for use at SWMU 32 will be a standard Indiana seed mixture for open and disturbed areas. The seed mixture includes perennial ryegrass and tall fescue. Planting rates and optimum soil pH for this mixture are presented in the Handbook. Following seeding, the seeded areas will be covered with temporary erosion control matting to provide additional stabilization until vegetation is established.

Erosion and sediment control devices will remain in place until permanent stabilization is established over the disturbed areas. Erosion and sediment control devices will not be removed by the EMAC contractor until directed by the Navy.

## **7.0 SCHEDULE**

The EMAC contractor shall include a schedule with the Work Plan. The schedule should start with a notification to proceed and extend through project completion and demobilization. It shall include the project kickoff meeting, deliverables, project milestones, and major work items.

The project kickoff meeting must occur prior to mobilization. The meeting will include the Site Superintendent, a Navy representative and others. The EMAC contractor must provide a minimum of 7 calendar days notice to the Navy prior to the kickoff meeting.

The EMAC contractor shall be required to commence work upon the approval of the Work Plan and within 7 calendar days after receiving the notice to proceed, and give the Navy a two week notice prior to mobilization to the site. The EMAC contractor can prosecute the work diligently after receiving the notice to proceed.

NSA Crane will remain in operation during the entire construction period. The EMAC contractor shall schedule the work to cause the least amount of interference with the Facility.

Completion date for the project on the Site is to be determined. Completion will require final stabilization of disturbed areas and removal of all EMAC contractor facilities and equipment from the site.